

REMARKS

The Applicants have studied the Office Action dated October 19, 2004 and have made amendments to the claims to distinctly claim and particularly point out the subject matter which the Applicants regard as the invention. No new matter has been added. It is submitted that the application, as amended, is in condition for allowance. Claims 1-3, 5-11, 13-16 and 18 have been amended; new claims 20 and 21 have been added; and claim 17 has been canceled without prejudice. By virtue of this amendment, claims 1-16 and 18-21 are pending. Reconsideration and allowance of the pending claims in view of the above amendments and the following remarks is respectfully requested.

In the Office Action, the Examiner:

- (1-2) rejected claims 1, 4-10, 12-15 and 17-19 under 35 U.S.C. §102(b) as being anticipated by Egorov et al. (U.S. Patent No. 6,326,921);
- (3-4) rejected claim 2 under 35 U.S.C. §103(a) as being unpatentable over Egorov et al. (U.S. Patent No. 6,326,921) in view of Kadambi et al (U. S. Patent Publication No. 2003/0201943 A1); and
- (5) rejected claims 3, 11 and 16 under 35 U.S.C. §103(a) as being unpatentable over as being unpatentable over Egorov et al. (U.S. Patent No. 6,326,921) in view of Alameh et al. (U. S. Patent No. 6,348,897).

Amendment to the Specification

The Applicants have amended the specification to correct a typographical error in the paragraph that begins at page 14, line 4. The reference number that refers to the antenna structure illustrated in FIG. 7 has been corrected to be "720" instead of "710." Support for this amendment is found in the specification at, for example, page 14, line 23 to page 15, line 2, and in FIG. 7. No new matter has been added by this amendment.

Amendment to the Claims

The Applicants have amended the independent and dependent claims to more clearly describe the claimed invention. The independent claims have been amended with amendments similar to those of claim 1. The amended text of claim 1 will therefore be

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used as an example in the following discussion to illustrate the claim amendments.

Independent claims 1, 7, 8 and 15 of the present invention, as exemplified by amended claim 1, have been amended to more clearly specify that "the parasitic element is ohmically isolated from ground." Support for this amendment is found in the specification in, for example, FIG. 4, which illustrates a lumped element circuit diagram for the PIFA and parasitic element. FIG. 4 shows that there is no ohmic ground connection to the parasitic element. This amendment is further supported by FIGs. 2, 3, 7, 8 and 9, of the subject specification which all illustrate parasitic elements with no ohmic connections at all. No new matter has been added as a result of all of these amendments.

Dependent claim 2 was amended to more clearly identify that the "parasitic element comprises three ohmically connected arms that join at substantially right angles and that radiantly couple to at least three arms of the PIFA." Support for this amendment is found in the specification at, for example, page 6, line 22 through page 7, line 11. No new matter has been added by this amendment.

Dependent claims 3, 11 and 16 have been amended to more clearly identify that the "parasitic element comprises three ohmically connected segments that are arranged in a shape that generally conforms to the shape of the PIFA." Support for this amendment is found in the specification at, for example, page 6, line 22 through page 7, line 11. No new matter has been added by this amendment.

Dependent claims 5, 13 and 18 were amended to specify that the parasitic element conforms to a surface that is above the PIFA. Support for this amendment is found in the specification at, for example, page 6, lines 16-21, page 15, lines 3-10 and FIGs. 2 and 7. No new matter has been added by this amendment.

Dependent claim 6 was amended to more clearly specify that "the parasitic element is mounted on the surface, wherein the surface is between the PIFA and the parasitic element, the surface comprises at least a portion of a case of a wireless

communications device." Support for this amendment is found in the specification at, for example, page 4, lines 14-18, page 7, lines 20-23 and page 15, lines 12-13. No new matter has been added by this amendment.

Dependent claim 14 was amended to more clearly specify that "the parasitic element is mounted on the surface and the surface comprises at least a portion of a case of a wireless communications device." Support for this amendment is found in the specification at, for example, page 4, lines 14-18. No new matter has been added by this amendment.

New dependent claim 20 claims an antenna according to claim 1, wherein the PIFA is substantially mounted above a ground plane, and wherein the parasitic element is located on a side of the PIFA that is opposite the ground plane. Support for this claim is found in the specification at, for example, at page 8, lines 13-17 and FIGs. 3 and 7. No new matter has been added by this amendment. The Egorov reference teaches a parasitic element that is "in the same plane as the PCB ground, that is, the parasitic element is at the same height as the PCB ground" or that is between the height of the PIFA structure and the ground plane. Egorov, Column 5, lines 33-35 and FIGs. 3 and 4. The Applicants respectfully assert that the Egorov reference or the cited prior art of record, taken either individually or in combination with one another, does not teach or suggest mounting a parasitic element onto a case of the communications device. Further, new dependent claim 20 depends from amended independent claim 1. As discussed below, amended independent claim 1 distinguishes over the cited prior art, therefore new dependent claim 20 distinguishes over the cited prior art for at least the same reasons.

New dependent claim 21 claims an antenna according to 6, wherein the PIFA is in contact with a first side of the surface and the parasitic element is in contact with an opposite side of the surface, the opposite side being opposite the first side. Dependent claim 6, defines the surface to comprise at least a portion of a case of a wireless communications device. Support for new claim 21 is found in the specification at, for example, page 7, line 22 through page 8, line 17 and in FIG 3. No new matter has

been added. The Applicants assert that the cited prior art of record does not teach or suggest an antenna with this claimed structure. Further, new dependent claim 21 ultimately depends from amended independent claim 1. As discussed below, amended independent claim 1 distinguishes over the cited prior art, therefore new dependent claim 21 distinguishes over the cited prior art for at least the same reasons.

Rejection under 35 U.S.C. §102(b) as being anticipated by Egorov et al.

As noted above, the Examiner rejected claims 1, 4-10, 12-15 and 17-19 under 35 U.S.C. § 102(b) as being anticipated by Egorov et al. (hereinafter "Egorov"). The Examiner cites 35 U.S.C. § 102(b) and a proper rejection requires that a single reference teach (i.e., identically describe) each and every element of the rejected claims as being anticipated by Egorov.¹

Exemplary embodiments of the present invention provide a parasitic element that operates with a Planar Inverted "F" Antenna (PIFA) to induce an additional RF band of efficient operation in the PIFA when operating as a combined PIFA – parasitic element antenna structure as compared to the operation of the PIFA alone. The exemplary embodiments of the present invention facilitate fabrication of a device incorporating the present invention.

The Egorov et al. discloses a low profile antenna that has a PIFA and a meandering parasitic element. The PIFA is mounted at a predetermined height above a substrate and parasitic element is mounted on the same substrate. The feeding pin of the PIFA is proximal to the ground pin of the parasitic element. The coupling of the PIFA and meandering parasitic element result in two resonances that are adjusted to be adjacent to each other in order to realize a boarder resonance. Egorov, Abstract. The parasitic element in Egorov is either in the same plane as the ground plane (Egorov, Col 5, lines 33-34), or the parasitic element is in a different plane, but lower than the PIFA antenna

¹ See MPEP §2131 (Emphasis Added) "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim."

(Col. 6, lines 38-40, FIG. 4).

With regards to amended independent claims 1, 7, 8 and 15, the Applicants have amended these independent claims to more clearly describe that "the parasitic element is ohmically isolated from ground." The Applicants respectfully assert that the prior art of record do not teach or suggest a parasitic element that is ohmically isolated from electrical ground. For example, the Egorov reference teaches "the parasitic element 350 is connected at one end to the PCB ground 340." Egorov, Column 5, lines 34-35. The other prior art references of record also all teach parasitic elements used with PIFAs that are grounded at one end. In contrast to these teachings, the parasitic element recited by amended independent claims 1, 7, 8 and 15 are "ohmically isolated from ground."

With regards to amended independent claim 6, the Applicants respectfully assert that the teachings of Egorov do not teach the claimed limitation of the "parasitic element is mounted on the surface, wherein the surface is between the PIFA and the parasitic element, the surface comprises at least a portion of a case of a wireless communications device." The Examiner cites FIG. 6 of the Egorov reference as a teaching of this limitation. Applicants respectfully point out that FIG. 6 of the Egorov reference is a generic front view of a cellular phone. Egorov, Column 7, lines 4-13. Although the discussion of FIG. 6 mentions that the "communications device 600 also includes a PIFA antenna with a meandering, parasitic element 650," (*id.*) the Applicants assert that FIG. 6 does not illustrate any structure that can be identified as a "PIFA antenna with a meandering, parasitic element" as recited by the text. The description that the communications device 600 also includes a PIFA antenna indicates that the PIFA antenna is internal to the communications device, as is illustrated in FIGs. 1-4 of that reference. The Egorov reference does not indicate or suggest mounting the parasitic element on a surface that is part of a portion of a case of a wireless communications device. In fact, the Egorov reference teaches a parasitic element that is "in the same plane as the PCB ground, that is, the parasitic element is at the same height as the PCB ground" or that is between the height of the PIFA structure and the ground plane. Egorov, Column 5, lines 33-35 and FIGs. 3 and 4. Given this teaching

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that the parasitic element is co-planar with the ground plane or between the ground plane and the PIFA, the Applicants respectfully assert that the parasitic element cannot satisfy these requirements while being mounted on a surface of the wireless communications device. The Applicants therefore respectfully assert that the Egorov reference or the cited prior art of record, taken either individually or in combination with one another, does not teach or suggest mounting a parasitic element onto a case of the communications device.

As discussed above, new claims 20 and 21 further define elements that are not taught or suggested in the prior art of record, including the teachings of Egorov.

Additionally, Applicants note that dependent claims 4-6 and 20-21, 9-10, 12-14, and 17-19 depend from amended independent claims 1, 8 and 15, respectively. As discussed above, amended independent claims 1, 8 and 15 distinguish over the cited prior art. Since dependent claims include all of the limitations of the independent claims from which they depend, Applicants further assert that dependent claims 4-6 9-10, 12-14, and 17-19 also distinguish over the cited prior art as well. Therefore, Applicants respectfully assert that the Examiner's rejection of claims 1, 4-10, 12-15, and 17-19 under 35 U.S.C. §102(b) as being anticipated by Egorov should be withdrawn.

Rejection under 35 U.S.C. §103(a) as Unpatentable over Egorov et al in view of Kadambi et al.

As noted above, the Examiner rejected claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Egorov in view of *Kadambi et al.* (hereinafter "Kadambi"). The Examiner recites 35 U.S.C. §103. The Statute expressly requires that obviousness or non-obviousness be determined for the claimed subject matter "as a whole," and the key to proper determination of the differences between the prior art and the present invention is giving full recognition to the invention "as a whole."

With regards to amended dependent claim 2, the Applicants have amended this claim to recite that the "parasitic element has at least three ohmically connected arms that join at substantially right angles and that radiantly couple to at least three arms of the

PIFA.” The Applicants respectfully assert that the cited references do not teach or suggest a parasitic element that has such a configuration.

As discussed above, new claims 20 and 21 further define elements that are not taught or suggested by the prior art of record, including the teachings of Egorov and Kadambi, taken either separately or in combination with each other.

Applicants note that amended dependent claim 2 depends from amended independent claim 1. As discussed above, amended independent claim 1 distinguishes over the cited prior art. Since dependent claims include all of the limitations of the independent claims from which they depend, Applicants further assert that dependent claim 2 also distinguishes over the cited prior art as well. Therefore, Applicants respectfully assert that the Examiner's rejection under 35 U.S.C. §103(a) over Egorov in view of Kadambi should be withdrawn.

Rejection under 35 U.S.C. §103(a) as Unpatentable over Egorov et al in view of Alameh et al.

As noted above, the Examiner rejected claim 3, 11 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Egorov in view of *Alameh et al.* (hereinafter “Alameh”). The Examiner recites 35 U.S.C. §103. The Statute expressly requires that obviousness or non-obviousness be determined for the claimed subject matter “as a whole,” and the key to proper determination of the differences between the prior art and the present invention is giving full recognition to the invention “as a whole.”

With regards to amended dependent claim 3, 11 and 16, the Applicants have amended these claims to recite that the “parasitic element comprises three ohmically connected arms that are arranged in a shape that generally conforms to the shape of the PIFA.” The Applicants respectfully assert that the cited references do not teach or suggest a parasitic element that has such a configuration.

With respect to the RF antenna arts, which are the subject of the present invention, the Applicants respectfully traverse the Examiner's assertion that “a change in shape or

profile is generally recognized as being within the level of ordinary skill in the art." Office Action Dated October 19, 2004, page 4, line 2. As is known in the RF antenna arts, the interaction of conductive and dielectric components that are in proximity to each other is the critical component to RF antenna design. The interaction of the conductive and dielectric components of an RF antenna is critically dependent upon the shape and arrangement of all such components. The "shape and profile" of these components critically affect the RF resonance characteristics of these elements. Further, the rearrangement and reconfiguration of conductive and dielectric components in antenna structures is a considerable part of antenna research and development which strongly militates against the Examiner's assertion. Many substantive antenna design improvements consist of rearrangement and reconfiguration of component "shape or profile." The Applicants respectfully assert that changes to the "shape or profile" of an antenna component is the inventive basis of many antenna design improvements.

The Applicants respectfully traverse the Examiner's taking official notice that "a change in shape or profile is generally recognized as being within the level of ordinary skill in the art." *Id.* Official notice is proper for "facts outside of the record which are capable of instant and unquestionable demonstration as being 'well-known' in the art."² (Emphasis added). Applicants respectfully request that a reference be cited indicating that such an assertion is true "in the art" of RF antenna design with respect to the shape or profile of conductive antenna components.³

If, however, the Examiner's statements are based on facts within the personal knowledge of the Examiner, the Applicants respectfully request that the Examiner support these references by filing an affidavit as is allowed under MPEP §707, citing 37 CFR 1.104(d)(2), and as specified in MPEP §2144.03.⁴

² See, MPEP §2144.03, citations omitted.

³ See, MPEP §2144.03, "If the applicant traverses such an assertion the examiner should cite a reference in support of his or her position."

⁴ See, MPEP §2144.03, "When a rejection is based on facts within the personal knowledge of the examiner, the data should be stated as specifically as possible, and the facts must be supported, when called for by the applicant, by an affidavit from the

As discussed above, new claims 20 and 21 further define elements that are not taught or suggested by the prior art of record, including the teachings of Egorov and Alameh, taken either separately or in combination with each other.

Additionally, the Applicants note that amended dependent claims 3, 11 and 16 depend from amended independent claims 1, 8 and 15, respectively. As discussed above, amended independent claims 1, 8 and 15 distinguish over the cited prior art. Since dependent claims include all of the limitations of the independent claims from which they depend, Applicants further assert that dependent claims 3, 11 and 16 also distinguish over the cited prior art as well. Therefore, Applicants respectfully assert that the Examiner's rejection under 35 U.S.C. §103(a) over Egorov in view of Alameh should be withdrawn.

CONCLUSION

The foregoing is submitted as full and complete response to the Official Action mailed October 19, 2004, and it is submitted that Claims 1-16 and 18-21, are in condition for allowance. Reconsideration of the rejection is requested. Allowance of Claims 1-16 and 18-21 is earnestly solicited.

The present application, after entry of this amendment, comprises twenty (20) claims, including four (4) independent claims. Applicants have previously paid for twenty (20) claims, including four (4) independent claims. Applicants, therefore, believe that an additional fee for the claim amendments is currently not due.

If for any reason the Examiner finds the application other than in condition for allowance, or the Examiner believes that there are any informalities which can be corrected by Examiner's amendment, a telephone call to the undersigned at (561) 989-9811 is respectfully solicited.

examiner."
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No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless Applicants have argued herein that such amendment was made to distinguish over a particular reference or combination of references.


The Commissioner is hereby authorized to charge any fees that may be required or credit any overpayment to Deposit Account 50-1556.

In view of the preceding discussion, it is submitted that the claims are in condition for allowance. Reconsideration, re-examination, and allowance of the claims is requested.

Respectfully submitted,

Date: January 19, 2005

By:



Jose Gutman
Registration No. 35,171

By:

Jeffrey N. Giunta
Registration No. 42,583

Customer Number 34952
Fleit, Kain, Gibbons, Gutman,
Bongini & Bianco P.L.
One Boca Commerce Center, Suite 111
551 N.W. 77th Street
Boca Raton, FL 33487
Telephone No.: (561) 989-9811
Facsimile No.: (561) 989-9812

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